

INSTRUCTION MANUAL

TYPE 310

QUAD COLORIZER

VISTA SYSTEMS inc

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SECTION 1

TYPE 310 QUAD COLORIZER SPECIFICATIONS

1.1 GENERAL DESCRIPTION

The Vista Systems TYPE 310 QUAD COLORIZER provides four video color signals which may be independently controlled in respect to hue, saturation and brightness. Each colorizer is controlled through a joystick. When the joystick is centered, no color subcarrier is produced, resulting in black, gray, or white depending on rotation of the joystick knob which controls brightness. Movement of the joystick from the center produces color, with saturation proportional to displacement from center and hue dependent on the direction of the displacement. Thus all parameters of a color signal can simultaneously be varied smoothly and continuously with one hand.

The output from each colorizer is a blanked subcarrier meeting all broadcast requirements for amplitude and stability. Although the TYPE 310 can be used in any NTSC video system, it achieves maximum effect when combined with the Vista TYPE 110 EIGHT-LEVEL MULTIKEYER and TYPE 210 QUAD VIDEO MIXER.

1.2 ELECTRICAL SPECIFICATIONS

The following performance is provided without warmup at any ambient temperature between + 10°C and + 50°C.

<u>Characteristic</u>	<u>Performance</u>
Range of subcarrier phase.....	0° through 360°, continuous
Range of subcarrier amplitude.....	0 volts through 1 volt peak-to-peak, continuous
Range of brightness level.....	Black through white, continuous
Blanking DC level.....	0 volts within 0.1 volts

For proper operation, the following electrical terminal conditions must be observed.

<u>Terminal Characteristic</u>	<u>Condition</u>
Drive signals required.....	Blanking, subcarrier
Subcarrier input amplitude.....	2 volts peak-to-peak into 75 ohms.
Blanking input amplitude.....	4 volts peak-to-peak into 75 ohms. Positive ex- cursion to be 0 volts with- in 0.5 volts.

The TYPE 310 presents the following electrical terminal conditions.

<u>Terminal Characteristic</u>	<u>Condition</u>
Impedance, all inputs.....	High impedance, loop-through
Output impedance.....	75 ohms within 5 ohms
AC power requirement.....	10 watts, nominal
Rear panel connector type.....	BNC
Front panel connector type.....	Switchcraft "Tinijax", Type 41

SECTION 2

INSTRUCTIONS FOR USE

2.1 INTERCONNECTION

The TYPE 310 QUAD COLORIZER produces four independent, non-composite output signals, each consisting of a blanked color subcarrier. No input video signals are required, but EIA standard blanking and subcarrier drive signals must be connected to the TYPE 310 at rear panel jacks. The TYPE 310 normally presents the output signals at front-panel miniature jacks. The TYPE 310, option 01, presents the output signals at rear-panel BNC jacks.

2.2 OPERATION

When properly connected and with AC power applied, the TYPE 310 output signals may be handled in the same manner as any other non-composite video signal. If displayed directly on a color monitor, a TYPE 310 output signal will produce a flat, uniform color field. When the joystick is centered, the result will be white, gray, or black, depending on the rotational position of the joystick knob. Movement from the center will create color, with the hue depending on the direction of movement and the saturation depending on the extent of movement. If movement toward the top of the unit is defined as 0° , movement toward 240° will produce reds, toward 120° will produce greens, and toward 0° will produce blues. Other colors are produced by movements yielding combinations of these three primaries.

Move the joystick as far as it will go to the right with no up or down movement. Adjust R 1 so that the subcarrier output amplitude is approximately 0.7 volts peak-to-peak. Tune L1 for maximum output amplitude. Readjust R 1 for 0.7 volts peak-to-peak subcarrier. Move the joystick as far as it will go to the left, again with no up or down movement. The subcarrier output amplitude should be 0.7 volts \pm 0.1 volts. If it is outside this limit, re-center the appropriate joystick pot to yield approximately equal subcarrier amplitudes at the extreme right and left excursions of the joystick. Repeat the above process for up and down movements of the joystick, adjusting amplitude with R7.

Repeat the entire above process for each of the remaining modules.

SECTION 3

CIRCUIT DESCRIPTION

The Vista Systems TYPE 310 QUAD COLORIZER contains a common power supply, subcarrier drive generator and four identical, independent colorizer modules.

POWER SUPPLY AND DRIVE GENERATOR

Dual full-wave rectifiers, CR1, CR2, CR3 and CR4 produce unregulated source potentials of approximately 14 volts. Zener diodes CR5 and CR6 provide reference voltages of approximately 8 volts, which are compared to an adjustable fraction of the output voltages by a dual op-amp, type MC1458CP-1, IC101. These op-amps drive pass transistors, Q101 and Q102 which control the supply voltages. Power supply potentials may be adjusted to +10 volts and -9 volts with the trimmers R101 and R102, located adjacent to IC101.

Subcarrier arriving at the subcarrier input connector is passed through a buffer emitter follower, Q103, to two RC phase shifters which provide subcarrier signals of 45 degrees and -45 degrees. These signals pass through output buffer amplifiers Q104, Q105, Q106 and Q107 and level controls R112 and R113 and are conducted to the colorizer modules.

COLORIZER MODULES

Each joystick module contains two analog multipliers, IC1 and IC2, and a blanker, IC3. Each multiplier is a Motorola type MC1496L integrated circuit which is fed one of the two subcarrier phases and a control voltage generated by movement of the joystick control. The amplitude of the multiplier output depends on the control voltage while the polarity of the output signal depends on the polarity of the control voltage. Positive control voltages produce in-phase output signals. Negative control voltages produce output signals which are 180° out of phase. The multiplier outputs are added and filtered in the tuned circuit comprising L1 and C7 to produce a subcarrier signal of arbitrary phase and amplitude as shown in fig. 1. This combined signal drives buffer amplifier Q1 consisting of a 3N128 FET in a source-follower configuration. The source-follower provides the isolation and impedance matching necessary to

properly drive the type MC1445L high-speed analog switch blanker IC3. The blanker is controlled by Q2, a 3N128 FET which effectively grounds pin 2 of IC3 when the blanking waveform is at 0 volts and acts as an open circuit when the blanking waveform is at -4 volts.

The 100 ohm pot R12 adjacent to the blanker IC permits adjustment of blanking level. The DC level of the unblanked subcarrier is determined by the voltage at pin 4 of IC3, which is adjusted by rotation of the joystick knob. The maximum excursion of this DC offset voltage, which controls brightness in the created picture, is determined by the settings of two 100 ohm pots, R16 and R17.

SECTION 4

MAINTENANCE

4.1 SETUP AND ADJUSTMENT

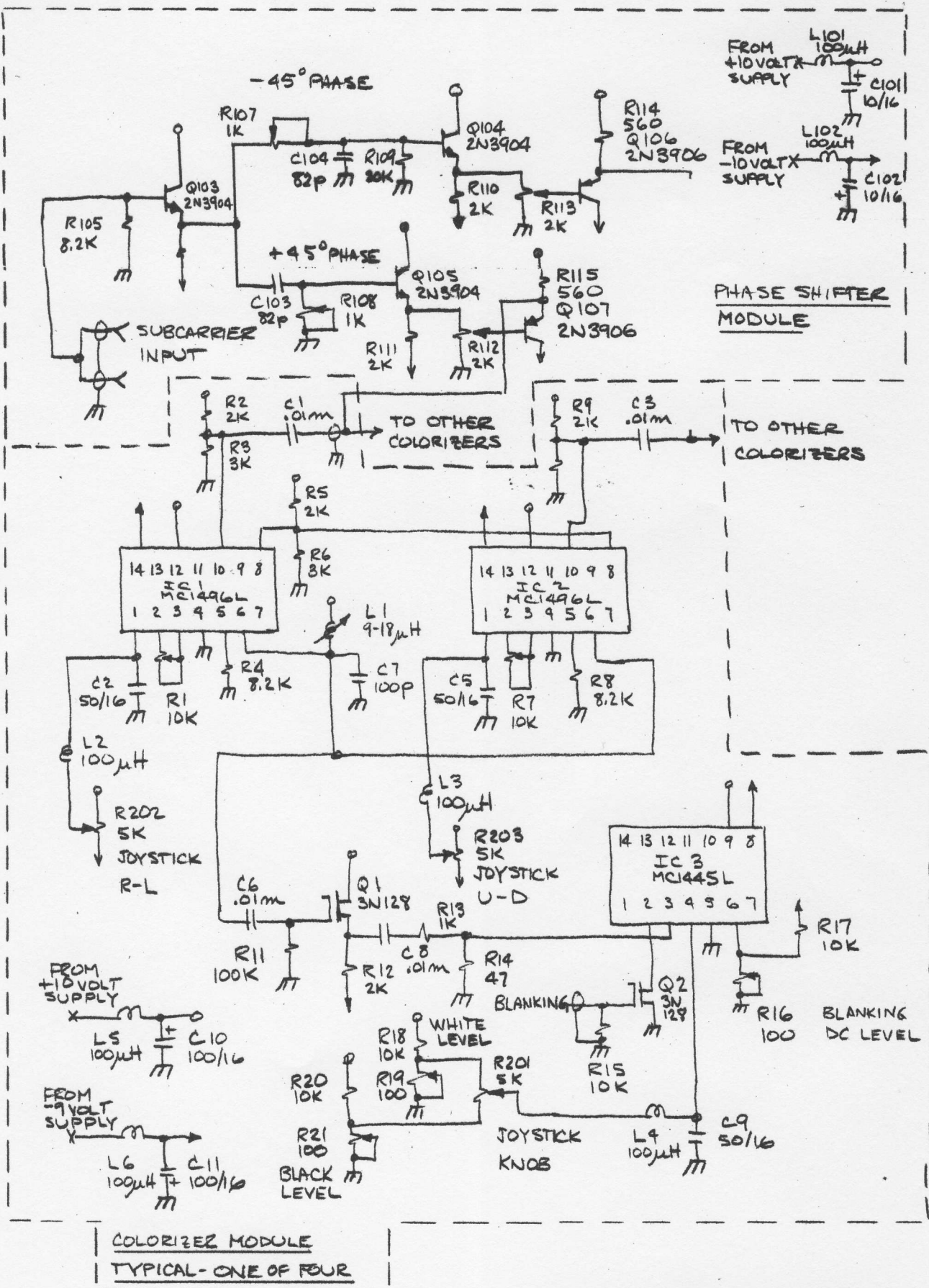
Remove the top and bottom chassis covers from the TYPE 310. Connect and terminate subcarrier and blanking drive signals. Terminate all outputs in 75 ohms. Adjust R101 and R102 for +10 volts and -9 volts at the emitters of Q101 and Q102, respectively.

Connect the subcarrier input to the external trigger input of a wideband oscilloscope using a high-impedance X10 probe. Connect a second X10 probe to the subcarrier input and to the oscilloscope vertical input. Adjust the oscilloscope sweep rate so that one full cycle of subcarrier exactly spans 8 major graticule horizontal divisions, and one positive subcarrier peak coincides exactly with the screen center. Move the second X10 probe to the emitter of Q107. Set the wipers of R112 and R113 at midrange. Adjust R108 so that a positive peak of the subcarrier occurs exactly one major horizontal graticule division to the left of screen center.

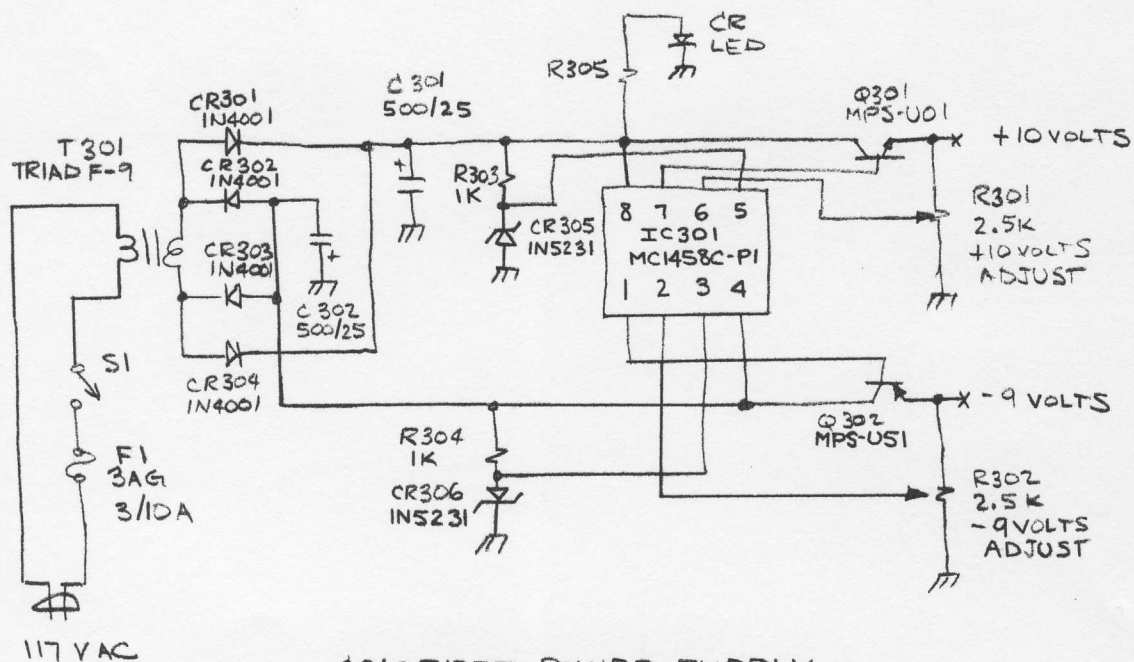
Adjust R112 for a peak-to-peak amplitude of 0.1 volts. Move the second X10 probe to the emitter of Q106. Adjust R113 so that a positive peak of the subcarrier occurs exactly one major horizontal graticule division to the right of screen center. Adjust R113 for a peak-to-peak amplitude of 0.1 volts.

Move the trigger pickup probe to the blanking input. Set the oscilloscope sweep rate to 20 usec/major div. Connect the output of one colorizer to the oscilloscope input, terminated in 75 ohms. Adjust R12 for a blanking level of 0 volts DC. Precisely center joystick. Move R202 and R203 on the sides of the joystick module so that no subcarrier is present at the output. Cement R202 and R203 in place using silicone sealant, General Electric or equal. This product is available in most hardware stores.

Rotate the joystick knob fully CCW. Adjust R16 so that the DC level of the unblanked portion of the output waveform is 0.05 volts. Rotate the joystick knob fully CW. Adjust R17 so that the DC level of the unblanked portion of the waveform is .71 volts. Rotate the joystick knob so that the output level is 0.35 volts.



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COLORIZER POWER SUPPLY

TYPE 310 QUAD COLORIZER

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960 INDUSTRIAL AVE

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